

Technical Note

Project:	Evidence to support Hampshire 2050 Commission	
Subject:	Hampshire 2050 Commission	
Author:	Olga Anapryenka	
Date:	27/11/2018	
Distribution:	Adrian Gray	

Please note: Atkins is now a member of the SNC-Lavalin Group; where “Atkins” is referred to in this document, this is to be read as “SNC-Lavalin Atkins”.

Atkins has been approached by Hampshire County Council to gather evidence from the UK and abroad and provide justification of how innovation and technology could inform a Vision for Hampshire 2050. We are delighted to provide our expert input to the Leader’s Commission.

The key objective of this technical note is to share Atkins’s thoughts around trends in the transportation industry, challenges they put on the transport ecosystem and potential benefits they can bring.

We have summarised the evidence in the key 5 sections presented below:

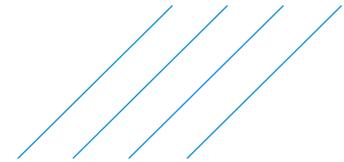
1. Evidence on future trends and changes;
2. Hampshire specific challenges and opportunities;
3. Potential for innovation;
4. Cross cutting elements – impacts on multiple service areas; and
5. Potential benefits and outcomes.

Key references used to support the note are presented below:

- SNC-Lavalin’s Atkins White Papers: “Journeys of the future” and “From transport to mobility”;
- Dr Wolfgang Schuster’s (technical director for SNC-Lavalin’s Atkins business) article “Moving from transport to mobility: joining the dots”.

1. Evidence on future trends and changes

We are seeing several mega trends having an impact on the design and provision of transport. Urbanisation and climate change are the two key drivers that are having a huge impact on areas such as public transport capacity and priority, fuel efficiency and the increasing use of active travel



modes.¹ At the same time, we are seeing social and economic trends starting to change behaviours and attitudes: fewer young people are regular drivers and, in particular, if they are driving then it is in a hired or shared car rather than one they own themselves.

Indeed, this trend has emerged at the same time as bike hire schemes have also taken off across the world with examples of big Chinese companies as Mobike and Ofo transforming bike-sharing market. Early adopters have been on a steep learning curve in coming to terms with dockless bikes, and there have been some very different responses. For example, Mobike has stopped its operation in Manchester due to vandalism.²

The key mega trends experienced by the transportation industry are summarised below:

- **Urbanisation:** congestion, demand for infrastructure, air quality, changing travel patterns and habits with the consequences such as pressure on transport networks, investment requirements and regulations to limit pollution. According to the Inrix 2017 Global Traffic Scorecard, the costs of congestion for all UK drivers came to more than £37.7bn in 2017, or an average of £1,168 per driver. London has been named the most congested city, with motorists spending approximately 74 hours a year caught up in peak time congestion.³
- **Climate change and sustainability:** resource depletion, air quality, greater focus on resilience and regulatory action with consequences such as fuel efficiency, multiple energy sources and changed behaviours. A research by Bloomberg New Energy Finance shows that sales of electric vehicles are increasing from a record 1.1 million worldwide in 2017, to 11 million in 2025 and then surging to 30 million in 2030 as they become cheaper with China leading this transition. By 2040, 55% of all new car sales and 33% of the global fleet will be electric.⁴
- **Demographics:** population growth, aging population, changing habits of millennials resulting in more pressure on transport capacity, risk of isolation, lack of access to mobility and lack of funding from public funds. While population is growing, improvements in healthcare and lifestyles mean the population is getting older: in 2016 in the UK 18% of people were aged 65 and over, and 2.4% were aged 85 and over.⁵
- **Technological development:** personalisation, on-demand services, increasing penetration of smartphones resulting in development of innovative services and products, emerging new business models and the use of business analytics. Ofcom's Communications Market Report shows that people in the UK now check their smartphones, on average, every 12 minutes of the waking day. Two in five adults (40%) first look at their phone within five minutes of waking up, climbing to 65% of those aged under 35.⁶

Technological evolution is at a pace of unprecedented change. As a direct result the transportation sector is experiencing a period of significant disruption, with new technologies, products and services fundamentally shifting customer expectations and opportunities.

New market players appear bringing disruption to established services and business models. A new concept of Mobility as a service (MaaS) has been developed. MaaS is a novel approach to mobility which focuses on the integration of multi-modal transport services into a single interface, that offers tailor made mobility solutions based on customer needs and preferences, providing customers with a seamless travel.

¹ Journeys of the future: introducing mobility as a service, Atkins;
http://www.atkinsglobal.co.uk/~media/Files/A/Atkins-Corporate/uk-and-europe/uk-thought-leadership/reports/Journeys%20of%20the%20future_300315.pdf

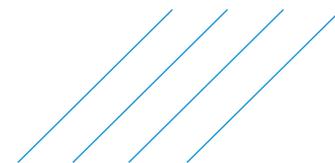
² <http://www.gizmodo.co.uk/2018/09/mobike-politely-removes-bikes-from-hire-in-manchester/>

³ <https://motortransport.co.uk/blog/2018/02/06/uk-traffic-congestion-rates-among-worse-europe-says-inrix/>

⁴ Electric Vehicle Outlook 2018, Bloomberg New Energy Finance

⁵ <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/articles/overviewoftheukpopulation/july2017>

⁶ <https://www.ofcom.org.uk/about-ofcom/latest/features-and-news/decade-of-digital-dependency>



Another growing trend in access over car ownership is the rise of the collaborative economy. According to research by McKinsey & Company, one out of ten new cars sold in 2030 may likely be a shared vehicle. A rapidly expanding social trend having a major impact on businesses and regulators. There is similar evidence in the CarPlus Annual Survey of car club members where 64% said they were less likely to buy a private car in the next few years as a result of their membership. New on-demand ridesharing services appearing around the world such as:

- ViaVan operating in London, Amsterdam and Berlin, which has recently expanded its services to Milton Keynes.
- Ford's 'Chariot' shuttle service, which operates in the United States and has just been launched in London.
- Uber, a company born from innovative technology (in this case big data analytics) that is now challenging the taxi industry globally. Uber has recently acquired bike-sharing start up JUMP to offer electric bike sharing services in the United States alongside introduction of new monthly subscription service.
- Waze, a company providing a GPS navigation software app, has made a move into ride-hailing too.

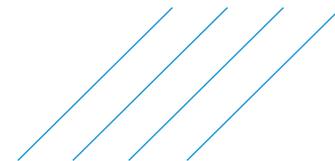
The market is rapidly developing as customers, transport authorities, businesses and governments understand these trends and technological advances. Never more so has there been such huge opportunity potential for improvement and innovation.

2. Hampshire specific challenges and opportunities

As mentioned in Hampshire Local Transport Plan, transport is an enabler of activity and in many ways essential to the success of society. Every day, Hampshire's transport network carries people, goods and services to every corner of the county. We have captured a few of high-level challenges being faced by Hampshire County Council which may only be exacerbated by funding budgets, growing populations as well as environmental targets:

- Hampshire is a largely rural county with high car ownership and travel patterns dominated by car. 85% of the area is rural but 77% of people live in urban areas.
- Out-commuting and long-distance commuting due to the strategic location of the area and the attraction of London.
- Very high car ownership, especially in the north but still approx. 15% of population without access to a car - Hampshire has more cars than any other county and two-thirds of commuters in Hampshire travel by car (2011 Census).
- Lack of alternative travel choices, pockets of isolated deprivation. Groups and individuals without access to a car who experience difficulty accessing opportunities, often where conventional public transport services are expensive to deliver.
- Meeting the needs of an ageing population. Overall population is projected to increase by 7.4% by 2023, however the 70+ age bracket is projected to jump by a massive 25.8%.
- Numerous public transport operators throughout the county - in Hampshire there are 30 bus operators providing over 31 million passenger journeys a year.

The County Council has significant responsibility to ensure transport and travel in Hampshire is safe, efficient, sustainable, inclusive and reliable. Sustainable growth, competitiveness of the Hampshire economy and quality of life should be supported by achieving consistency in the role out of new technologies throughout the county – e.g. electric vehicles infrastructure, smart parking and Mobility as a Service. Also, the personalisation agenda, which focuses on meeting individual care needs in the way people choose their transport modes, will make different calls on the public and community transport system.



Intelligent Mobility will deliver for Hampshire in many ways such as how to:

- Take a user centric approach to improve people's journeys and the movement of goods from A to B;
- Design and future-proof planning and space in towns, cities, offices and businesses;
- Utilise smart technologies to improve choice, information and accessibility;
- Increase the efficiency, sustainability and safety of transport – and how we best pay for and use transport;
- Look for greater linkages between rural and urban networks;
- Plan greater connectivity, accessibility of data and cyber protection;
- Ensure transportation is inclusive and that digital services meet the needs of our society.

3. Potential for Innovation

The transport sector can meet these trends head on and it is starting to do so. This new thinking in the sector is often referred to as 'Intelligent Mobility'. Intelligent mobility is an end-user and outcome-focused approach to connecting people, places and services - reimagining infrastructure across all transport modes, enabled by data, technology and innovative ideas. Intelligent Mobility places users at the heart of its approach, focusing not only on improving the transit of people and goods, but also on transforming the infrastructure of our cities and communities to increase efficiency and safety, maximise resources, boost sustainability, create resilience and promote economic growth. Intelligent mobility will transform the transport sector and has an estimated global market of £900 billion by 2025.⁷

UK Government introduced its Industrial Strategy⁸ which aims to boost productivity by backing businesses to create good jobs and increase the earning power of people throughout the UK with investment in skills, industries and infrastructure. It is no surprise that one of the four key themes is "Future of mobility: becoming a world leader in shaping the future of mobility".

At Atkins, our Intelligent Mobility business is working with multiple clients delivering leadership projects shaping the future of mobility.

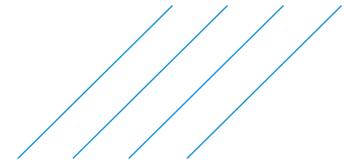
We are working for the Department for Digital, Culture, Media & Sport on a 5G feasibility study to explore the benefits of increased investment in upgrading the connectivity on the UK roads. The study identifies the short- and medium-term demand for connectivity. Upgrading the digital infrastructure on the UK's roads is the backbone for deployment of connected infrastructure, continuous connectivity for the Internet of Things and additional services emerging daily in this period of significant technological change. The increased capabilities of 5G will also help to future-proof the country's infrastructure, as Connected and Autonomous Vehicles become more commonplace on our roads.

Atkins are working in collaboration with Transport for Greater Manchester (TfGM) to build a case for Mobility as a Service in Greater Manchester to achieve their strategic goals. MaaS is the integration of transportation services from public and private providers through a platform that creates and manages a complete journey from A to B for the end user. It puts users at the core of transport services, offering tailor made journeys based on individual needs and preferences. A case for MaaS is being developed through identification of key problems and drivers, identifying how MaaS supports TfGM's goals, development of benefits and potential funding options as well as developing delivery strategy options.

We have also run a mix-mode transport service for 2 weeks with 10 people in Cambridge testing MaaS concept. Regular Cambridge commuters shared journeys from their home to a Park & Ride

⁷ <https://www.cranfield.ac.uk/press/news-2016/intelligent-mobility-centre-nears-completion>

⁸ <https://www.gov.uk/government/topical-events/the-uks-industrial-strategy>



site. The trial provided 118 journeys, and participants travelled over 100 miles and made over 100 bus journeys.

Our expertise is global, responding to a recent population boom, Colorado Department of Transportation (CDOT) has taken a bold step to effect change and transform its aging transportation system by embracing technology. CDOT is investing \$20 million to combat congestion and improve safety through the use of intelligent mobility technology in the next year. As one of three consulting firms selected as advisers on the program, Atkins is serving as an extension of CDOT's staff helping to move projects from conception through procurement and construction - facilitating a reimagining of transportation infrastructure through intelligent mobility solutions. The goals include: reducing the cost of transporting goods by 25%; turning a rural state highway into a zero-death road; and reducing congestion and vehicle emissions on Colorado's critical corridors. We're using improved analytics, innovative strategies in autonomous/connected vehicles, and big data to exceed these goals and create a safer more efficient future.

Whether we are streamlining operations, integrating technology, optimising infrastructure, analysing transport data patterns, innovating the planning process or improving end-user journeys, Intelligent Mobility is already bringing visionary ideas to life and driving essential progress.

4. Cross cutting elements – impacts on multiple service areas

Preparing our infrastructure for a world of low emission transport, housing and energy will need careful consideration, planning and foresight.

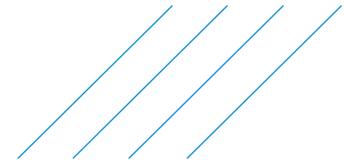
In order to join the dots, it's important to start by taking an 'umbrella view' and to think about the whole system and how it is working and evolving. "Do we truly understand who uses our transport system, and how their transport, workplace and home needs are changing and, most importantly, what the effects are on our towns, cities and infrastructure? By considering and understanding these changes on workplaces and transport, our employers, planners and designers from all the sectors can work together to ensure offices and their supporting transport links continue to meet society's needs.⁹

This 'joined up' thinking and collaboration to deliver is vital, ensuring towns and cities remain attractive and sustainable places to live and work. Such seamless co-evolution between sectors will bring wider socio-economic impacts including city-wide and environmental benefits for the long term and help to attract inward investment.

Respectively, Hampshire County Council should recognise and explore relationships with other initiatives such as Government Industrial Strategy. The vision should consider various sectors, not just concentrating on economic considerations but making sure the long-term strategy is in place and that it should be beneficial for future generations. The county should prioritise funding allocation considering all necessary infrastructure and housing demands alongside needs of the residents.

The future approach to mobility needs to be much more integrated with other sectors (healthcare sector, land use planning etc.) and emerging technologies, such as artificial intelligence and blockchain, and look across a wide range of partners, such as charities, government and academia. In doing so, we can ensure that transport, and its impacts between sectors, is considered from the very start - ensuring it is designed to generate the desired socio-economical outcomes. With the convergence in multiple technologies, there must be a co-ordinated business operating model across multiple themes that links various data sets such as Blockchain, the Internet of Things, Big Data, Mobility as a Service with economic outcomes. This requires an integrated and connected

⁹ Wolfgang Schuster, SNC Lavalin's Atkins Technical Director;
<https://www.techuk.org/insights/opinions/item/14151-moving-from-transport-to-mobility-joining-the-dots>



ecosystem of transport and the underlying physical and infrastructure investments and incentives needed in order to drive change.

The transport network will have to be seen and understood as a single system. This is as critical for transport authorities in terms of how to plan and manage opportunities as it is for customers in using it. One way this will manifest itself will be for private and public transport modes to converge into a single system responsive to the needs of all transport users, reflecting the growing trends of access over ownership and the sharing economy.

Consequently, Hampshire County Council should:

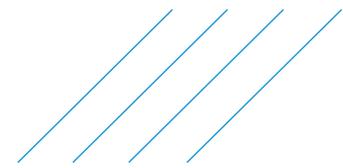
- Develop a single vision, which will bring all the departments together on the way to build a better place for future generations to live in. Hampshire County Council should have a strategic oversight role bringing together all transport activities happening across the county and to ensure that any dependencies are understood and analysed.
- Ensure future transport projects and pipeline and future proof projects closely linked with emerging technologies and business models such as MaaS.
- Establish collaboration with the neighbouring local authorities and wider Local Enterprise Partnership (LEP) area to maximise the impact of the investment in Intelligent Mobility.

5. Potential benefits and outcomes

There are many benefits from Intelligent Mobility solutions including:

- Environmental – reducing emissions, improving air quality and reducing the environmental impact through innovative transport options;
- Safety – improving access to safe and secure walkways and cycle ways, making it easier and more attractive for people to choose;
- Travel modes – providing new, innovative or alternative options for commuters and road users;
- Transforming towns and cities – as great places to work, visit and travel: offering well connected travel and transport options including Connected and Autonomous vehicles;
- Improving choice and customer satisfaction – connecting all modes of travel with the latest technology and data to bring additional benefits to passengers;
- Smart transport – making the most of existing assets such as park and rides, car parks, motorways, trains, trams, airports, walking, cycling.

We have mapped the MaaS principles and benefits against five of the 6 Hampshire strategic themes to show the alignment and the benefits that are likely to be achieved through testing and embedding MaaS principles.



Hampshire 2050 Vision Strategic Themes



ECONOMY



MOBILE CONNECTIVITY AND ENERGY



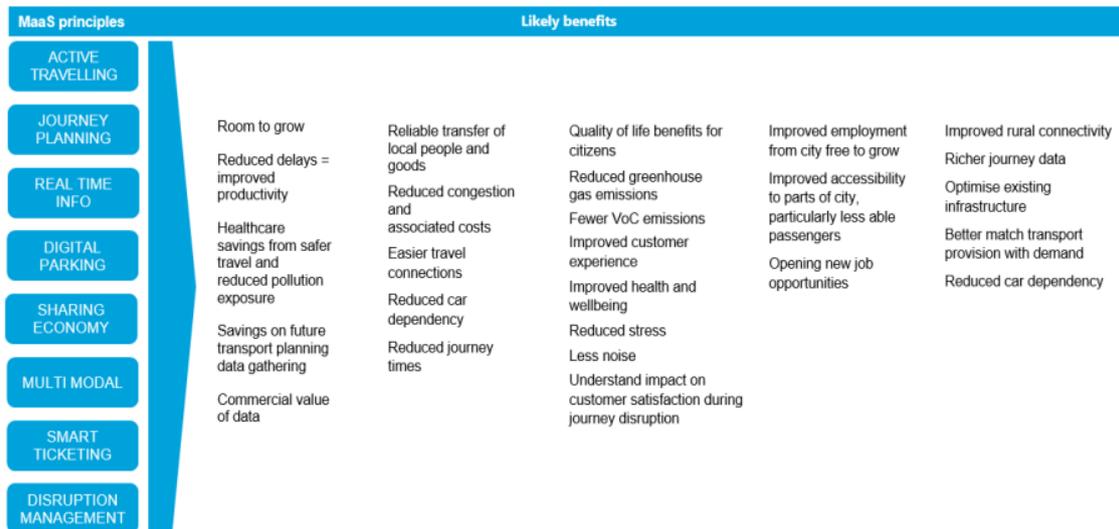
ENVIRONMENT AND QUALITY OF LIFE



DEMOGRAPHIC AND SOCIETAL CHANGES



RURAL HAMPSHIRE



Change isn't coming, it is already here. From connected and autonomous vehicles, to platooning freight trucks, to real time information, social and health apps, big data, cloud computing etc. What we do with it and how we make a positive difference with these tools is the challenge we must face now. It is vital though that through all this change the customer is at the heart of the transformation. We must land our next generation services and solutions in the world our customers occupy and address their pain points through tangible and sustainable solutions.

Enhancing the customer experience benefits everyone. There is a value in bringing seamless integration to customers across their entire journey. That entire journey will more and more frequently combine traditional modes of transport with the new opportunities and services being created as well as new methods of purchasing mobility. Customers are looking for ways to make their journeys easier both in planning and undertaking them – we only need to look at the uptake of new services such as online journey planning and ticket purchasing; the use of social media to communicate with operators; and the growth of apps like Citymapper, Moovit and Waze, to see that customers have an appetite for new ideas. It is now for the transport sector to respond and, with Intelligent Mobility predicted to be worth £900bn globally over the next 10 years, this really is only the beginning of an exciting journey.

Never has there been such a time for transformation change for Hampshire County Council – Government is investing in leadership projects and with a clear vision and roadmap for 2050 the county should be able to unlock those opportunities setting their seal as an exemplar across UK and Europe. We believe at Atkins, we have the right knowledge and experience in order to advise Hampshire County Council on the 2050 Commission and looking forward to supporting the Council in developing a Vision for Hampshire 2050.